

Andrew B Christensen
Chair

August 10, 2003

Dear Andy,

The Origins Subcommittee met at NASA Headquarters on July 1 and 2, 2003. The Origins Subcommittee and the SEUS had several joint sessions at our DC meeting.

Astronomy and Physics Division

Anne Kinney briefed the OS and SEUS on a wide range of issues and accomplishments of the Astronomy & Physics Division. We learned of exciting recent results from HST, HETE and Chandra. The first light images from GALEX gave us a taste of the exciting possibilities of this recently launched mission. GALEX is another in the growing line of successes in the Explorer program. With GALEX successfully operating, Astronomy and Physics now has a dozen missions in orbit. We congratulate the GALEX team on its successful launch.

We thank Phil Crane for his briefing of the status of the Origins theme. He reported on recent TPF activities and the constitution of an ESA counterpart to the TPF SWG. He noted that the newly selected NAI programs included three programs with a significant astronomical component.

Origins Focused Missions

There is a significant gap in the current mission structure between MIDEX and DISCOVERY class missions and flagship missions. Missions in the intermediate class (\$400 – 700 Million) could serve as precursors for the flagship missions and address major science questions that are not part of the flagship program. The NAS decadal survey recommended developing a mission line in this class. The Ultraviolet/Optical white paper has outlined a few of the exciting possibilities in this class.

SAWG

Joel Bregman reported on the April 22-23 meeting of the SAWG. He presented the exciting Celestial Navigator System. This system would improve connectivity between the different NASA archives and provide a uniform set of improved services. The proposed system leverages the progress made in the NSF ITR project and is a vital step towards constructing a Virtual Observatory that will enable simultaneous access to multi-wavelength observations of astronomical objects. This resource will enable astronomers to address fundamental scientific questions by combining results from space-based and ground-based data.

The Origins Subcommittee endorses this proposal and encourages NASA to also augment the data analysis program so that astronomers can exploit the new possibilities enabled by this “software mission”. With R/A funds already severely stretched, we recommend that new funds be identified for this program.

APWG

Kathryn Flanagan reported on the June 16-17 meeting of the APWG. The APWG expressed its concern about lack of growth in the level of funding for the R&A (research and analysis) Program. Data analysis and theory both significantly enhance the science return from current NASA missions and are the seed corn for technology and ideas for future NASA missions. The Origins Subcommittee was concerned by cuts in the Astrophysical Theory Program. The Astrophysical Theory Program significantly enhances the scientific return from existing missions and is one of the vital sources of the scientific questions that drive future NASA missions. ***The Origins Subcommittee encourages NASA to follow the advice of several recent senior reviews and NAS reports that have strongly endorsed increasing funds for the very productive theory program.***

EPO

Jeff Rosenthal highlighted the on-going success of the Space Science Education and Public Outreach program. Ian Griffin briefed us on the exciting EPO work being done within the Origins program. The success of the EPO program is built on close collaboration between space scientists and educators and the ability of individual missions and groups to develop innovative programs. Under the new management structure, Space Science EPO now reports to Code-N. While this new structure will hopefully enable cross-theme coordination that will benefit educators and most importantly, students, the Origins Subcommittee hopes that this restructuring will not break the vital link between active scientists and educators, nor restrict the flexibility of the existing programs

EXPLORER PROGRAM

Paul Hertz reviewed the history of the explorer program and to a joint session of the OS and SEUS. There are several motivations for reconsidering the distribution of sizes of the Explorer missions: (1) concerns that there may no longer be launch vehicles available for MIDEX and SMEX missions; (2) concerns that there may not be many more compelling science missions that can be done within the tight SMEX budget cap; and (3) the broad set of science missions that can not be done within the MIDEX cost cap yet are not flagship missions. Paul reported that the most recent SMEX has a significantly higher cost cap. We look forward to hearing about the results of the review of the responses to this new AO. The majority of the OS and SEUS endorsed continuing the current program of launching 2 SMEX's and 2 MIDEX's every three years. This frequent access to space enables space scientists to address a wide range of exciting astronomical questions.

JWST

John Mather briefed the committee on recent replanning exercise. At our last meeting, we feared that JWST replan would lead to significant loss in science capability for this flagship mission. ***The Origins Subcommittee congratulates the JWST project on its successful restructuring of the JWST program. With the replan, JWST retains its key scientific capabilities, reduces mission complexity and risk and is now within its budget cap. We note the positive role played by our ESA partners in this effort.***

SIM

Jim Marr and Mike Shao reported on recent progress on SIM. Shao reviewed the wide range of exciting science that will be enabled by the mission. Not only will SIM be able to detect Earth-like planets around nearby stars, its wide angle astrometric capabilities will enable significant advances in our understanding of fundamental properties of stars, provide new insights into the distribution of dark matter in our Galaxy and improve our ability to measure the Hubble constant. We are enthusiastic about the proposed new observing mode that will enable astronomers to determine the distances and proper motions of tens of thousands of stars. Via telecom, Jim Marr described the significant technical progress made by the SIM team. ***SIM is a challenging mission: we congratulate the SIM scientists, engineers and managers on their successfully overcoming many of the technical hurdles.***

MICHELSON SCIENCE CENTER

The committee is very concerned about the lack of competition for the science centers for major NASA missions. This was dramatized by the growth of the Michelson Science Center to include SIM, LBTI, and TPF in addition to its original Palomar and Keck Interferometer components with no competition. With this full suite of instruments, the scope of the Center could become comparable to STScI. We were informed that an open competition would have a severe programmatic impact on SIM. If this is not true, then we would like to see the SIM science center openly competed. ***Since TPF is still in its architectural definition phase, we encourage an open competition for its science center and encourage NASA to compete contracts for major science centers.*** Competition will produce strong centers at lower cost to NASA.

NAAAC

Bob Gehrz (via telecom) described the status of their committee, which will advise both NASA and NSF on coordinating their astronomical priorities. The NAAAC will coordinate the development of strategic plans for both agencies and help identify gaps and duplications in the astronomy programs at the two agencies. Abi Saha is a member of both the Origins Subcommittee and the NAAAC and will serve as a liaison between the two committees. We look forward to working with our colleagues on the NAAAC over the coming years.

MESSENGER

Sean Solomon presented the exciting science promised by MESSENGER, a Discovery mission that will study Mercury, the mysterious innermost planet. MESSENGER has a modest cost overrun due to the late delivery of many of its key components. Colleen Hartman described how this overrun will lead to a delay in the next Discovery AO and launch. Future Discovery missions will carry a larger contingency. ***The Origins Subcommittee supports the decision to cover the cost overrun from within the Discovery program and looks forward to the successful launch of MESSENGER.***

HST

Eric Smith reported on the Black committee study on the future of HST and described the on-going deliberations of the Bahcall committee.

While NASA contemplates the long-term future of HST, it is important to continue to get the best possible science from the instrument in the coming years. There are two important new instruments, COS and WFPC3, that are nearly ready for launch. These new instruments will enable an exciting suite of science programs. ***The Origins Subcommittee encourages NASA to deploy these new instruments as part of SM4 as soon as possible. We also reiterate our strong support for the JWST and SIM programs, the next major flagship missions. We recommend that these programs not be delayed to enable any future HST refurbishment mission.***

TECHNOLOGY

Chris Moore described recent developments in Code R that are vital to the future Origins programs. Code R has recently issued a draft NRA (NRA-03-OAT-01) that is focused on addressing several of the most important technology needs of the space science division. The Enabling Concept and Technology Program (ECP) is developing new technologies that will be vital to future Origins mission: advanced measurement and detector technology and large aperture technology. ***The Origins Subcommittee was very pleased to see the close cooperation between Code R and Code S.*** This new approach will hopefully address the long-standing concerns about the difficulties in supporting technologies at the mid-TRL levels.

Jim Breckenridge reported on the technology program within the Origins program. He described recent progress in developing lightweight mirrors. These mirrors will enable exciting future astronomical missions. ***The Origins Subcommittee was concerned that ultraviolet technology was not included in the presentation as a vital area for technology development.***

Gary Martin, the NASA Space Architect, described NASA long-term plan. He presented the intriguing possibility of astronauts aiding in the assembly of large telescopes. This could enable the construction of systems capable of directly imaging Earthlike planets around nearby stars.

Sincerely,

David Spergel, Chair, for the Origins Subcommittee